

REMARKS

Reconsideration of the present application is respectfully requested.

I. Status of the Claims

Claims 1, 2 and 7 are withdrawn.

Claims 4-5 and 8-11 are pending.

Claim 4 and 6 are cancelled.

Claim 3 has been amended. No new matter has been added.

III. Rejections under 35 U.S.C. § 103(a)

Claims 3-5 and 8-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. 4,544,793 to Okado in view of JP 61-058812-A.

Claim 3, as amended, recites that alkaline earth metals are evenly distributed throughout the body of the catalyst. Claim 3 also has provides that the zeolite seed crystal is dispersed evenly throughout the gel mixture. Support for this amendment can be found in ¶[0030] of the published application. It is the Applicant's position that neither of these features is described nor inherent in the prior art. The cited prior art, alone or in any reasonable combination fails to recite the complete subject matter disclosed in amended claim 3. Specifically, the cited prior art, alone or in any reasonable combination, fails to recite an even distribution of alkaline earth metals throughout the body of the catalyst and the evenly disperses seed crystals are evenly dispersed throughout the gel mixture.

Okado (both the Japanese Laid open Patent 60-251121, and the U.S. language reference 4,544,793 cited by the Examiner) is cited as teaching a ZSM-5 Zeolite catalyst that is produced from a synthesis mixture similar to that described in amended claim 3. However, Okado fails to provide the proper dimensions of the seed crystal described in amended claim 3. The Examiner

seeks to overcome this deficiency by citing JP-812. JP-812 is cited as teaching ZSM-5 seed crystals that are on the order of those seed crystals recited in amended claim 3.

It is Applicant's position that the combination of the cited prior art, in fact, fails to provide for the results found in the present invention. Applicant provides support for that position in the form of a supplemental Declaration under §1.132. Applicant has demonstrated, through the supplemental Declaration and Appendix A (including figures 1-2 and tables 1-2) that the present invention yields unexpected results that differ from a mere combination of the prior art. Without more teaching, it is clear that the results obtained by the process employed in amended claim 3 is non-obvious in light of the prior art.

The seed crystal found in JP-812 was prepared (as recited in the §1.132 Declaration filed March 02, 2011) according to the descriptions in the prior and the resulting catalyst (to which the seed crystal of JP-812 was the core) was then synthesized in accordance with the process for producing a catalyst as disclosed in Okado ('793). The resulting product was a particle having an average size of 5.0 μm . This value is significantly greater than that found in the amended claim 3, which sets its upper bound at 2 μm . As such, merely combining the known disclosure of the prior art does not yield the present invention.

Furthermore, any combination of the prior art would not be expected to result in a uniform distribution of alkaline earth metal within the structure of the zeolite catalyst. In the process of the present invention, the inclusion of alkaline earth metals before the hydrothermal process causes the even distribution of the alkaline earth metals after the hydrothermal process throughout the body of the catalyst. In the process described in the '812 reference, ZSM-5 is used as the seed crystal. The cores of ZSM-5 are generated and grown on the surface to a size of approximately 0.5 μm , thus synthesizing atomized zeolite. However, when combined with the disclosure of Okado ('793), this process does not result in the formation of atomized zeolite. This is because when Ca is contained in the synthesizing components of Okado, zeolite crystallization rates are lowered, such that it takes a longer time for the cores to be generated on the crystal surface, as compared to a synthesis based purely on JP'812. The end result is that smaller seed crystals (diameters of less than several tens of

nm) are formed when the processes of Okado and JP-812 are combined. Additionally, those seed crystals tend to dissolve back into the mixture due to their small relative size. Clearly the proposed combination of the cited prior art references fail to produce atomized zeolite as described in the present invention. Consequently, that combination cannot render obvious the disclosure found in claim 3. Additionally, since Ca tends to inhibit the crystallization of zeolite, it is clear that any combination of the cited prior art cannot use Ca in the first core generation stage with ZSM-5. The prior art can only generate a zeolite using a seed crystal ZSM-5 and Na, Si, Al. Ca is added, if at all, after the crystallization process has proceeded to the point that its inclusion does not materially affect the formation of the zeolite.

For example, Applicant points out that the translated portion of the Japanese Okado ('121) reference does not indicate the use of Ca prior to hydrothermal synthesis. Additionally, the only reference to a rare earth metal (Calcium Acetate) refers to an impregnation of catalyst with the earth meal via a disclosed method **after** hydrothermal synthesis. Alternatively, the U.S. Okado ('793) does reference the use of Ca prior to the hydrothermal synthesis step. However, the reference recites that aluminum sulfate nonahydrate and calcium acetate monohydrate are dissolved in water and mixed with a solution of sodium hydroxide and tetrapropylammonium to obtain a gel. See column 4, line 65 to column 5, line 13. This gel is then subjected to hydrothermal treatment in an autoclave. It is clear that this mixture does not involve a zeolite seed crystal. Therefore, because of the interaction of the combined prior art, (the seed crystal of '812 and the process of Okado ('793)) Ca is not uniformly distributed throughout the resulting catalyst.

Applicant provides in the Supplemental Declaration a listing and figures relating the distribution of Ca according to the present invention. Appendix A, of the Supplemental Declaration provides Figures 1 and 2 and Tables 1 and 2, which detail the amount of alkaline earth metal, i.e. Ca, distributed within the body of the catalyst. Table 1 clearly shows an even Ca distribution across

the body of the catalyst as described in the present invention. Fig 1 also provides visual evidence of the uniform distribution of Ca in the body of the catalyst.

Table 2 and Figure 2 are directed to a catalyst that is synthesized using the process of Okado and the seed crystal of JP-812. It is clear from the data, that the uniform distribution of Ca within the structure of the zeolite crystals resulting from the process of the present invention, is not present in the prior art.

Therefore it is clear that the combination of the prior art fails to provide for the complete invention as described in the amended claims. As such, the rejection based upon 35 U.S.C. §103(a) has been overcome and should be removed. Additionally, Applicant notes that the dependent claims all depend directly or indirectly from claim 3. As such, they are likewise non-obvious in light of the foregoing arguments. The rejection under 35 U.S.C. §103(a) as it pertains to them, should also be removed.

CONCLUSION

In view of the above discussion, applicant believes the pending application is in condition for allowance. It is believed that all of the stated grounds of rejections have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections.

It is believed that no fees are required with this submission; however, if it should be determined that fees are required, the Commissioner is hereby authorized and requested to charge any needed fees (to include extension-of-time fees) to Deposit Account No. 50-4570, and Applicants hereby petition for any needed extension of time.

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Respectfully submitted,

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